to better explain the essence of the invented method. Neither those notions and terms, nor close or remote analogs or equivalents thereof are used in the Herz patent. Stating that the Herz patent teaches the same method as disclosed by us, Examiner uses the language of our application verbatim but fails to point out which of Herz' notions and terms are, in Examiner's opinion, analogous or equivalent to ours. In fact, none of the quotations of the Herz patent, provided by Examiner to support her assertions, pertains to the subject of Claims 1 – 8 of our application. Thus, Examiner's assertions that our Claims are anticipated by Herz represent circulus in probando, i.e. a circular reasoning in which the proposition to be proved is contained in one of the premises: first, Examiner asserts that a particular claim of our application has been anticipated by Herz, then she uses the language of our claim to interpret the irrelevant quotations of the Herz patent. Below, in Par. 2 of Remarks, we will demonstrate how the Herz patent does not anticipate, render, or minimally interfere with our Claims.

REMARKS

1. Claim Objections

Examiner objects to Claim 7 because "Examiner is unclear as to what Applicant meant by "its" (see line 3)" and requires appropriate correction. Claim 7 reads:

> "The method of claim 4 wherein monomer matrices based on attributes (parameters) describing power of objects are computed with the use of a metric representing the ratio of a lower value of a parameter to its higher value".

Although the above language unambiguously conveys that the claimed metric represents the ratio between a parameter's lower and higher values for a same object, we hereby comply with Examiner's requirement and correct Claim 7 as follows:

> "The method of claim 4 wherein monomer matrices based on attributes (parameters) describing power of objects are computed with the use of a metric representing the ratio of a lower value of a parameter to a higher value of the same parameter".

2. Re: Claim Rejections

On page 3 of the Detailed Action (hereinafter called Action), Examiner wrote:

"Regarding Claim 1 Herz teaches a computer-based method for computation of similarity matrices of objects in high-dimensional space of attributes with the purpose of clustering by method for evolutionary transformation of similarity matrices, allowing for fusion of different attributes (parameters) on a dimensionless basis..."

We disagree with Examiner. In fact, the following is true.

1. Clustering by the method of evolutionary transformation of similarity matrices was invented by Leonid Andreev (U.S. Patent 6640227, issued October 28, 2003) and could not have been used by Herz in the patent issued February 1, 2000. In the Herz patent, clustering is performed by entirely different and commonly known methods – in particular, by p-median method (col 36, lines 48-49) which involves the pre-establishing of the number of clusters and thus represents the opposite of the method of evolutionary transformation of similarity matrices which provides clustering wherein the establishing of the number of clusters is automated and unsupervised.
2. Herz neither claims nor discloses, neither directly nor by implication, anything regarding "fusion of different attributes (parameters) on a dimensionless basis". Fusion of different attributes (parameters) on a dimensionless basis is taught and demonstrated by the Applicant – for instance by the example of fusion of 108 climatic parameters in Detailed Description in the '542 application ([0093]). The methods used by Herz by no means can provide the result defined in Claim 1 of the '542 application, for, as it is explained in specifications of the '542 application and in Paragraph 2 of the above Comments, a dimensionless basis for similarity-dissimilarity computations does not emerge by itself upon the use of conventional techniques for similarity-dissimilarity computation, but it can only be achieved through the procedures described in Claims 1, 2, 6, and 7 of the '542 application. Herz applies Euclidean distances for dissimilarity computations (col 40, lines 47-48), as well as for clustering. For instance, in the Herz equation (36), the distance "between the vector of movies watched by customer I and the centroid of cluster $k.v_i$" is computed by using Euclidean distance (equation (37)) (col 39, lines 36-60). As pointed out in Paragraph 2.2 of the above Comments, computation of monomer matrices on a dimensionless basis is incompatible with the use of Euclidean distances. The latter can be used for computation of distances between objects in a space that is, at the least,

two-dimensional, whereas dimensionless similarity coefficients used in monomer matrices are computed based on only one parameter.

Further in the same paragraph, Examiner states that Herz teaches a method

"... comprising the steps of: a) computation of similarity matrices for each of attributes (parameters) individually, (col 19, lines 5-63)...".

We disagree with Examiner. Herz does not compute similarity matrices for each of attributes (parameters) individually. In fact, it is clearly demonstrated by Equation (17) used by Herz for calculation of agreement matrix (col 19, lines 5-41). It has nothing to do with "computation of similarity matrices for each of attributes (parameters) individually". A similarity matrix based on one attribute individually represents a set of similarity coefficients for each pair of objects compared according to one parameter (see Paragraphs 3.1 and 3.2 of the above Comments). In order to understand that Herz applies a technique totally different from the method disclosed in the '542 application, suffice it to see the summation symbol (Σ) in Equation (17) and to note that the Equation involves the number of TV programs from 1 to J, their characteristics from 1 to K, and the number of experts from 1 to M, each of the above representing an individual parameter (attribute). If Examiner's above statement were correct, then Herz would have to further compute monomer similarity matrices in the total number of J + K + M; however, in reality the Herz patent does not contain any mention of computation of similarity matrices for each parameter individually. The lines 5-63 of col 19, referenced by Examiner, describe the calculation of an agreement matrix that, according to Herz, reflects similarities between customer profiles and content profiles. The Herz way of calculating an agreement matrix involves a concurrent use of all kinds of available parameters, which, in the opinion of Herz, may provide a desired effect. It would be hard to think of an approach as diametrically different from ours as the one described in col 19, lines 5-63 of the Herz patent. Neither the underlying logic, nor calculations can even remotely remind of anything having to do with the computation of monomer similarity matrices.

Thus, neither in col 19, lines 5-63, as referenced by Examiner, nor in any other part of the disclosure does the Herz patent teach a method that comprises the step of computation of similarity matrices for each of attributes (parameters) individually.

Further in the same paragraph, Examiner states that according to Herz,

> "... such matrices being monomer similarity matrices (i.e. by combining ... matrices) (col 5, lines 25-54)..."

We disagree with Examiner. Not only does not the Herz patent involve the computation of monomer similarity matrices, as defined in our Claim 1(a) and explained in Detailed Description ([0049], [0054], [0055], etc.), but the fact is that monomer similarity matrices as disclosed in our application cannot, by definition, be produced by "combining ... matrices". The Herz patent does not contain any mention – direct or implied – of "monomer similarity matrices", nor does it contain any discussion even remotely reminding of the concept of monomer similarity matrices. Moreover, as we demonstrated above in connection with Equation (17) used by Herz for calculation of agreement matrix, the calculation techniques used by Herz do not allow the computation of monomer similarity matrices. As to the excerpt in Col 5, lines 25-54, referenced by Examiner, it describes "the customer profile creating step, comprising the step of creating the customer profile a plurality of customer profiles for each customer", and so on, and has nothing to do with computation of monomer similarity matrices for a variety of customers, computed individually for each attribute (parameter).

Further in the same paragraph, Examiner states that Herz teaches:

> "... b) hybridization of all monomer similarity matrices into one hybrid matrix which is further used in clustering process (i.e. reads on the combined profiles of Mom and Dad in the evening and the combined profiles of the children in the afternoon) (col 5, lines 25-55)".

We disagree with Examiner, as neither col 5, lines 25-55, nor any other part of the Herz patent contain, directly or by implication, anything related to hybridization of similarity matrices, let alone monomer similarity matrices, regarding which it has been proven earlier in these Remarks that the Herz patent does not even involve their computation. If Herz does not compute monomer similarity matrices, how can he hybridize them? We have trouble understanding Examiner's reasoning in attributing to Herz the invention of something he never invented. The only plausible explanation to Examiner's errors may be the fact Examiner confuses the terms "objects" and "attributes (parameters)". Put simply (and in the context of clustering), an 'object' is something or someone that has properties and relations. An object's properties and relations are its 'attributes' (parameters, variables, etc.). For instance, in the Herz patent, 'objects' are "customers", i.e. TV program viewers. The programs that customers view, as well as expert opinions about those

programs, the degree of violence, sex, etc. in those programs are 'attributes' of customer profiles. According to our method, in order to perform the clustering of customer profiles, we would first compute monomer similarity matrices based on each of the attributes individually and then hybridize the monomer matrices to obtain a full picture of the customer pool [0056].

Herz does not describe such an approach to clustering of objects.

In rejection of Claim 2, Examiner states:

> "Regarding Claim 2, Herz teaches hybridization of monomer similarity matrices is performed so that all similarity coefficients in monomer similarity matrices for one and the same pair of objects are averaged through computation of their geometric or arithmetic means (col 10, lines 23-66 to col 11, lines 1-22)."

As we demonstrated above, the Herz invention does not deal, even in the most remote way, with computation of monomer similarity matrices and/or hybridization thereof. Examiner's reference to a Herz excerpt in col 10, lines 23-66 to col 11, lines 1-22, once again demonstrates unexplainable confusion and error on the part of Examiner as the Herz patent absolutely does not touch upon the subjects of our Claims 1 and 2, hence there is no point in Examiner's reference to "averaging through computation of their geometric or arithmetic means (col 10, lines 23-66 to col 11, lines 1-22)". Averaging through computation of geometric or arithmetic means is a trivial mathematical operation, just like multiplication, summation, etc., and the fact that it is used in the Herz patent does not mean that such use has anything to do with the procedure defined in our Claims 1 and 2, because in our invention the computation of mean values of similarity coefficients is a part of the procedure of hybridization of monomer matrices, which is not used in the Herz patent.

In rejection of Claim 3, Examiner states:

> "Regarding Claim 3, Herz teaches wherein each of monomer similarity matrices used in computation of a hybrid matrix is computed with the use of a metric that most optimally suits a respective attribute (parameter) (i.e. an agreement matrix so defined is the reciprocal of the distance d (=1/ac) in multidimensional space between the customer profile vector and the content profile vector and that many different distance measurement techniques may be used in determining the distance d) (col 5, lines 55-67 to col 6, lines 1-15)."

First of all, it must be pointed up that the above-cited contains a meaningless statement wherein "the use of a metric" is equated with "the reciprocal of the distance d (=1/ac) in

multidimensional space". The truth is that these two operations can be neither compared to nor contrasted with each other. Metrics are used to determine either dissimilarities or similarities between objects. The reciprocal of any similarity value is the measure of dissimilarity, and vice versa. This elementary mathematical operation has been known since hundreds years ago. The same operation is involved in computation of similarity matrices by using the XR-metric (see [0070], lines 1-8). The fact is that, when coupled with the ETSM method, the value $B^{|v_i - v_j|}$ accurately describes the distances between the objects' parameters. In the Equation (3) for computation of the XR-metric (see Detailed Description) the minus sign in the exponent of B indicates that the expression $B^{-|v_i - v_j|}$ represents inverse values of the distances between parameters of objects i and j, hence the resulting matrices are similarity matrices and not dissimilarity matrices. Our application does not claim priority in applying this operation as the latter represents common knowledge in mathematics. As to Examiner's statement that in the Herz patent the distance d (= 1/ac) is determined in multidimensional space, it provides perfect proof of the fact that the Herz patent has nothing to do with the invention disclosed in our application. Our invention provides that for construction of a dissimilarity matrix (i.e. a matrix that is based on inverse values of similarity coefficients) of a whole set of objects, each monomer similarity matrix must be subjected to inversion prior to hybridization. Thus, the fact that Herz determines the distance reciprocals right away in multidimensional space refutes beyond any doubt Examiner's statement that Herz computed monomer similarity matrices and further hybridized them.

There are known various metrics for computation of similarities/dissimilarities. For instance, dissimilarities can be determined by using Euclidean distance, "city-block" metric, Hamming distance, and many others. In principle, any of such metrics may be applied in practice. However, an opportunity of applying an optimal metric for each attribute (parameter) within a given set of parameters is provided only by our invention: in computation of each of the monomer matrices one can apply the most appropriate metric, after which all the monomer matrices are hybridized into the resulting dimensionless similarity matrix. By the heretofore available methods for construction of similarity matrices, one can choose any metric but cannot use different metrics for different attributes.

In rejection of Claim 4, Examiner states:

> "Regarding Claim 4, Herz teaches wherein a choice of metrics used in computation of monomer similarity matrices for further hybridization into a hybrid matrix depends on whether a respective attribute (parameter) describes a shape or power of an object (i.e. attributes such as amount and degree of sex, violence, and profanity; MPAA rating; country of origin; and the like) (col 11, lines 41-55)".

It is absolutely clear both from the Herz patent and these Comments and Remarks that Herz is not concerned with "a choice of metrics used in computation of monomer similarity matrices for further hybridization into a hybrid matrix" – firstly, because Herz does not compute monomer similarity matrices, hence does not hybridize them, and secondly, because the technology used by Herz does not allow the use of different metrics for different attributes.

Moreover, neither in col 11, lines 41-55, nor elsewhere in the Herz disclosure, is there any mention of "attributes (parameters) describing a shape and power". In the excerpt referenced by Examiner ("col 11, lines 41-55"), Herz states only that there exist many different attributes. However, that fact has been known to humankind since long before Herz filed his patent application. As to the '542 application, its Claim 4 teaches that in computation of a similarity matrix of a set of objects described in a high-dimensional space of parameters, each parameter can be represented in a metric that reflects either "shape" or "power" of a respective object. For example, if a parameter describes the length of an object, we use the "shape" metric, whereas for a parameter describing, for instance, the concentration of a gas, the "power" metric is used (see [0072, lines 1-8, of Detailed Description). The method applied by Herz does not allow the use of different metrics for one and the same set of objects.

To fully appreciate Claim 4, the latter must be considered along with Claim 5 which states that any of attributes (parameters) can and should be treated as describing either a shape or power. In other words, for the whole variety of possible attributes, one needs only two types of metrics. The Herz patent does not contain any anything that could be construed as anticipating the methods of Claims 3, 4 and 5 of the '542 application.

In rejection of Claim 5, Examiner writes:

> "Regarding Claim 5, Herz teaches wherein attributes (parameters) should be treated as those describing a shape or as those describing a power, depending on a problem to be solved by clustering analysis (col 15, lines 22-33)."

In truth, the above-referenced excerpt in column 15, lines 22-33, of the Herz patent reads:

> "Another way to make adjustments to the customers' combined ratings is through the clustering of customers. Customers are asked to give overall ratings for various programs. If a group of customers come up with very similar ratings for most of the programs in a category, it is assumed that the actual acceptance ranges for these customers for each characteristic relevant to the category forms a narrow distribution, i.e. their values are close to each other. However, if in the distribution of stated ratings, some outside values which are far away from the majority are seen, then the indication is that these outside values need to be adjusted."

As is seen, this excerpt has nothing in common with Examiner's interpretation of it. Thus, Examiner's reference fails to support Examiner's assertions.

The same is true for all other instances of Examiner's quotations of the Herz patent. To explain the grounds for rejection of the '542 application claims as being anticipated by Herz, Examiner uses the concepts and terms that have been first introduced in our application – such as "monomer similarity matrix", "hybridization of monomer matrices", "fusion of parameters on a dimensionless basis", etc. – and attributes them to Herz. In the meantime, not only do not these terms and concepts occur in the Herz language, but the fact is that the Herz invention does not even refer to any analogs of such terms or concepts. In the Herz patent, the calculation of agreement matrices and the clustering are performed by commonly used routine techniques, and therefore it does not claim any methods for computation of similarity matrices and data clustering – simply because Herz did not invent them.

3. Allowable Subject Matter

See Paragraph 2 of the following Conclusions.

CONCLUSIONS AND REQUEST FOR RECONSIDERATION

1. The foregoing Comments and Remarks distinctly and specifically point out Examiner's errors in rejecting Claims 1 – 8 as being anticipated by Frederick Herz et al. (US Patent No. 6020883). In the presented arguments, we have pointed out the specific distinctions that render Claims 1 – 8 patentable over the applied reference.

2. By proving that the Herz patent fails to anticipate or render limitations of the base claim of the '542 application and/or any intervening claims, we thereby proved that Claims 6 – 7, objected to "as being dependent upon a rejected base claim" but "allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims", do not need to be rewritten and must be allowed.

3. Applicant has corrected Claim 7 as required by Examiner.

4. Based on the foregoing, Applicant requests that Claims 1 – 8 of the '542 application are allowed.

If you have any questions and should like to contact us over the telephone, please call (520) 207-7244 after 5:30 pm Mountain Standard Time or (520) 390-9250 during the daytime. The mailing address is provided at the top of this letter and should be on file with USPTO following the address change notice submitted earlier.

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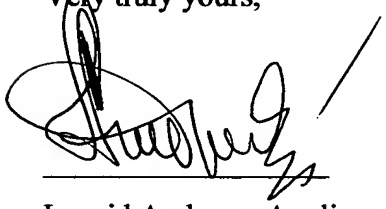

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